SEAGRASSES IN MISSISSIPPI SOUND

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Image provided by NOAA Coastal Services Center

SEAGRASSES

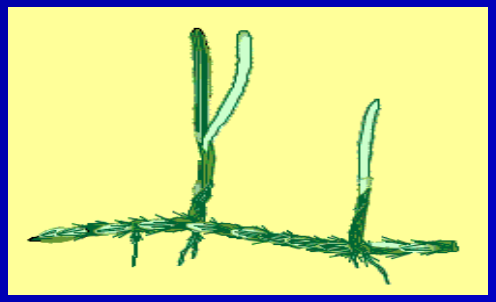
- Believed to have come from terrestrial plants that returned to the sea by gradual, progressive steps of acclimation to shallow fresh water, to shallow brackish water, and finally to submersion in marine water

- Presently 58 species, in 12 genera

SEAGRASSES

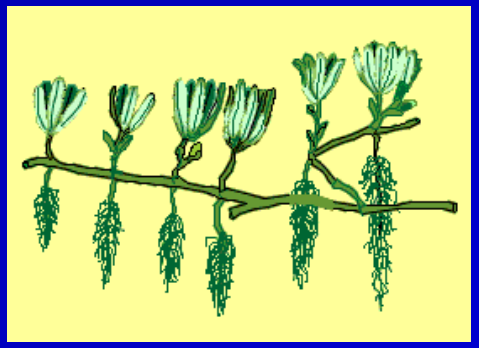
- Flowering plants (angiosperms) that live underwater
- Reproduce by seed or vegetative expansion
- The depths at which seagrasses occur is limited by water clarity, which determines the amount of light reaching the plant

MORPHOLOGICAL PATTERNS

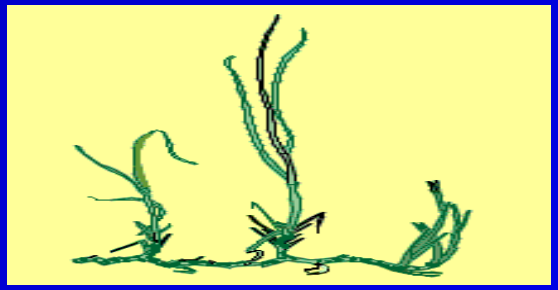


Turtle grass
(*Thalassia testudinum*)

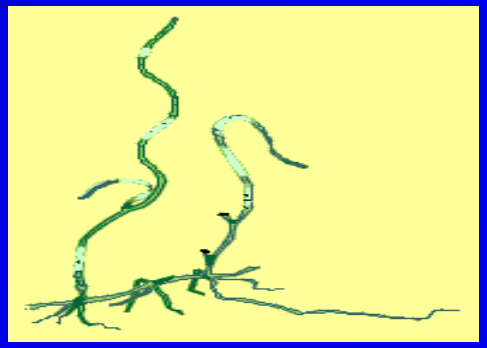
Widgeon grass
(*Ruppia maritima*)



Star grass
(*Halophila englemanii*)



Shoal grass
(*Halodule wrightii*)



Manatee grass
(*Syringodium filiforme*)

BIOLOGICAL FUNCTIONS

- Nursery/habitat during some or all stages in the life cycle of marine fish & invertebrates
- Relatively high rate of primary production drives detritus-based food chains
- Directly consumed by birds, dugongs and turtles
- Biological indicators of deteriorating water qua

PHYSICAL FUNCTIONS

- Reduce current velocity
  - Increased water clarity
- Dampen wave intensity
  - Reduced shoreline erosion
- Stabilize marine sediments

HUMAN APPLICATIONS

- Insulation
- Roofing thatch
- Binding soil
- Stuffing and packaging
- Manure, stock feed supplement, minerals
- Weaving, fiber products, paper-making
- Food

ANTHROPOGENIC IMPACTS

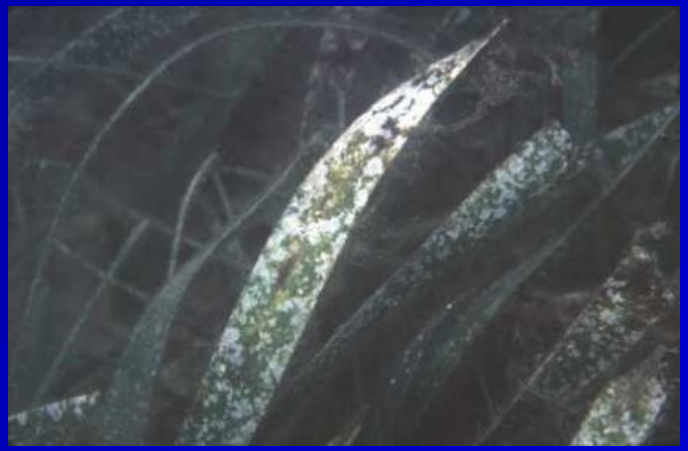
- Decreased water quality
  - Elevated nutrients
  - Increased turbidity
  - Contaminants
- Biotic and abiotic stressors
  - Seasonal storm events (hurricanes)
  - Bioturbation
  - Disease
  - Propeller / anchor damage

PROPELLER SCARRING

- Damage to root/rhizomes can take up to seven years to heal

EPIPHYTE GROWTH

Encrusting algae



Filamentous algae

Colonial algae

SEAGRASSES in MS SOUND

- **Past**
  - 5 Species
    - *Halodule wrightii*
    - *Halophila engelmannii*
    - *Ruppia maritima*
    - *Syringodium filiforme*
    - *Thalassia testudinum*
  - Areal coverage in 1969: 12,000 acres

(Eleuterius 1973)

- **Present**
  - 2 Species
    - *Halodule wrightii*
    - *Ruppia maritima*
  - Areal coverage in 1998: 1,998 acres

(Moncreiff *et al.* 1998)

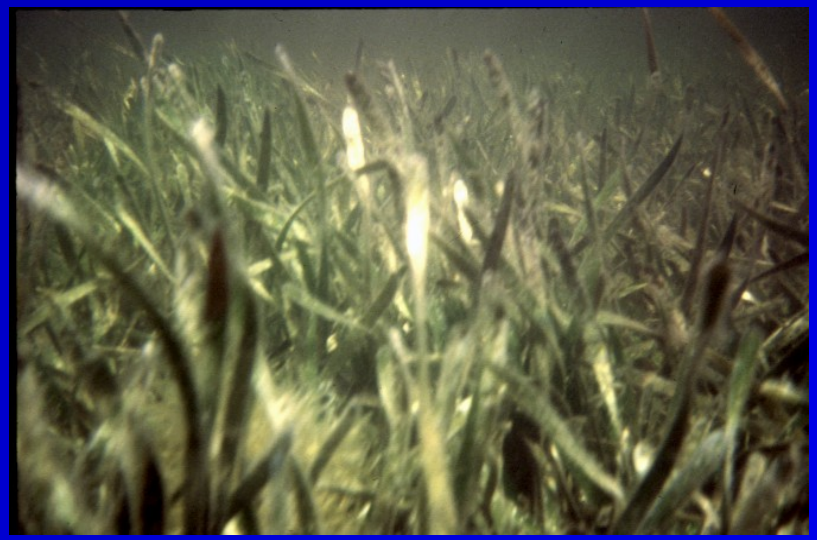
SHOAL GRASS (*Halodule wrightii*)

- Stress tolerant "Pioneer" species (elevated nutrients, disturbance)

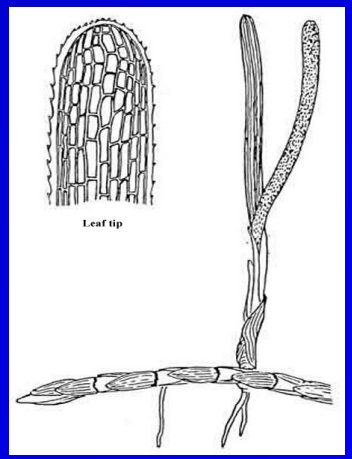
WIGEON GRASS (*Ruppia maritima*)

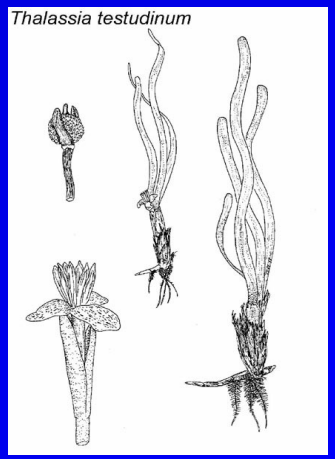
- Stress tolerant
  (low salinity, eleveated nutrients, disturbance)

TURTLE GRASS (*Thalassia testudinum*)



- "Climax" species
  - Often requires sediment modification by another seagrass species
  - Not tolerant of low salinity, low light, or high nutrient load

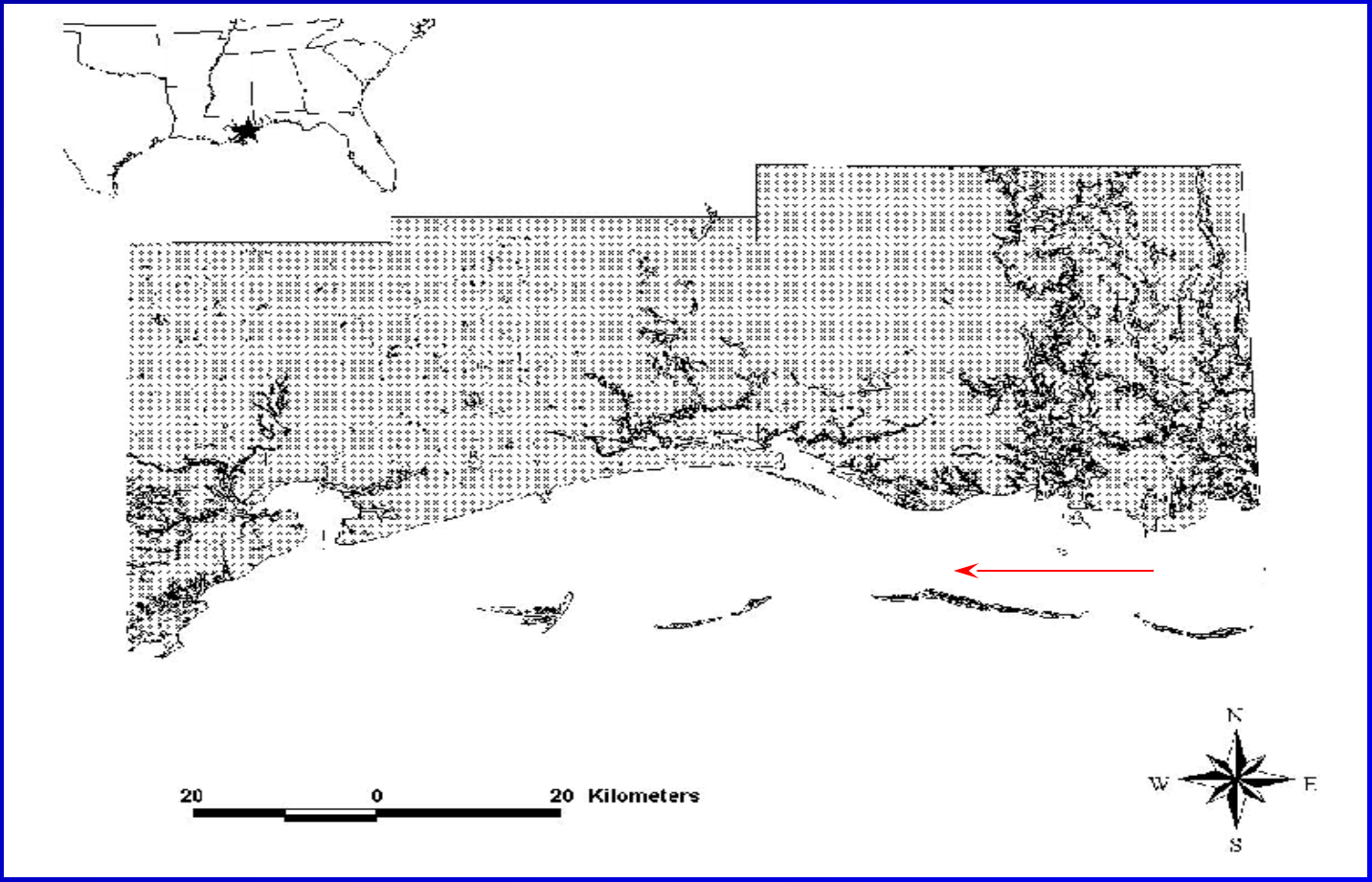




SEAGRASS RESTORATION in MS Sound

- Justification: turtle grass was historically present
- Why/How was it removed:
  - Hurricane Camille
  - Extended periods of low salinity
- Why is it not presently here: recruitment-limited
- Light levels equivalent to that in Big Lagoon, FL
- Epiphyte load not more than in Big Lagoon, FL

MISSISSIPPI SOUND



RESTORATION METHODS

- Collect and germinate seeds, plant seedlings
- Remove seagrass “plugs” from donor bed
- Propagate new shoot material from root/rhizome fragments

PROJECT OVERVIEW

- Granting agencies
  - NOAA / Gulf of Mexico Foundation
  - National Park Service
- Volunteer labor
  - Public participation (“ownership”)
  - Environmental education
- Planting material
  - Big Lagoon, Florida
  - Chandeleur Islands, Louisiana

RESEARCH ASPECT

- Different water depths (light availability)
- Plant within and outside of existing seagrass patches (biotic site preparation)
- Varying light levels for shoot propagation of root/rhizome fragments

POTENTIAL ECOLOGICAL BENEFITS

- Enhanced habitat for local marine species
- Increase in number and biomass of commercially and recreationally important fish and shellfish
- Reduced erosion along the northern edge of the barrier island chain

POTENTIAL ECONOMIC / AESTHETIC BENEFITS

- Income from recreational fishermen
- Enhanced shrimp production
- Bay scallop fishery (e.g. St. Joseph Bay, FL)
- Increased water clarity
- Ecotourism

RECOMMENDATIONS

- Continue efforts to improve water quality
- Restrict activities which are destructive to seagrass ecosystems
- Public education

Image provided by NOAA Coastal Services Center